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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,349	09/05/2003	Hans-Michael Sulzbach	PO-7787/HE-170	7812

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EXAMINER

NILAND, PATRICK DENNIS

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,349

Applicant(s)

SULZBACH ET AL.

Examiner

Patrick D. Niland

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/19/06.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-12 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/19/06 has been entered.

Claims 1-12 are pending.

2. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. The instant claim preamble recites "A method for the production of polyurethane foam material comprising controlling cell size in the foam made by continuous mixing of at least one polyol component and at least one isocyanate component and optionally additives to form a polyurethane reaction mixture..." The claim ultimately only recites "discharging the polyurethane reaction mixture" and "reducing the polyurethane reaction mixture pressure". The claims do not require a foaming step nor require foaming means, e.g. a blowing agent. It is therefore unclear what is required of the instant claims. Specifically, it is unclear when and how and where the polyurethane reaction mixture is foamed. While the preamble requires foaming there is no foaming step in the method particularly pointed out and distinctly claimed. Thus, it is unclear what is regarded as the instant invention. It is unclear how to control the cell size since foaming is never recited nor is a means to control the cell size recited. At the end of the claimed process a polyurethane reaction mixture is discharged and the pressure thereon reduced. The reaction mixture is not a foam.

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3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of the teachings of US Pat. No. 3346529 Peters, US Pat. No. 3807703 Day, US Pat. No. 5100699 Roeser, US Pat. No. 3319937 Wilson et al., US Pat. No. 3051455 Magester, and US Pat. No. 3881871 Porter.

These references each relate to continuously mixing polymer reaction mixtures to produce polyurethane foam and the devices for mixing the reactants. The shear and pressures generated in the devices of the prior art necessarily and inherently controls cell size. The method and device of Day is most similar to that of the instant claims and Day uses it to mix polyols and polyisocyanates and additives to make polyurethane foams, i.e. microporous polyurethanes, by mixing polyols and polyisocyanates and additives. See the figure on the cover of the patent and the entirety of the disclosure, particularly column 1, lines 37-68 and column 2, lines 1-67. It however lacks the so-called throttle of the instant claims and does not specify that the mixer has variable rotational speed. The baffle means of column 6, lines 29-58 meets the elements of the instant claim 11. "Injected" of column 4, line 44 et seq. implies "pumping" of the instant claims.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the pinch valve of the instant claim 10 on the nozzle 16 of Day because such valves are known for aiding in precision dispensing as taught by Roeser, column 3, lines 27-51 and would have been expected to give the benefits disclosed by Roeser to the device of Day.

Porter describes the back pressure created by such valves in similar systems and the desirability of such back pressure. This is thought by the examiner to be understood by the ordinary skilled artisan who is expected to have studied fluid dynamics and Bernoulli's principles in undergrad classes. It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use the blade pitches of the instant claim 1 and 4 to 6, which are not taught by Day, because these pitches give only predictable results relating to the back pressure described by Porter and the flow of material through the mixer described by Day when considered with the blade surface area and shape, the number of blades, and the rotational speed of the blades. No unexpected result stemming only from the blade angle is seen in a manner commensurate in scope with the cited prior art and the instant claims.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to use adjustable rotational speed for the stirrer of Day because Day implies such when one considers the disclosure of the variety of throughput rates of column 6, lines 59-61 in combination with the disclosure of column 3, lines 52-68; Magester shows that variable dispensing rates are required and why; such dispensing rates are related to the pressure in the mixing chamber which is related to the speed of the angled blades and is predictable considering Bernoulli's principles; and Wilson et al shows that the ordinary skilled artisan knows to vary paddle, i.e. blade, speed to change foam pore size at column 4, lines 62-69. Varying throughput is most easily accomplished by varying the speed of the blades creating the flow through the mixer. Furthermore, such variable speed mixers are well known.

The above discussed mixing device would clearly be useful as the "continuous reactor" of Peters, Fig. 1 or in the alternative, the above discussed modifications that are applicable to the

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continuous reactor of Peters Figure 1 would have been obvious to have been made to this reactor for the same reasons as applied to the mixer of Day.

It would have been obvious to one of ordinary skill in the art to use the above device to form the instantly claimed foam because Day column 6, lines 58-68 shows his device to be versatile and useful in other processes as well as to have the capability of mixing polyurethane forming reactants to give a microporous polyurethane and each of Magester, which uses a very similar device to day and the instant claims, Wilson et al., and Porter show similar mixing devices to be useful in making polyurethane foams with Wilson noting the relationship between shear rate and cell size as stated above.

It is expected that the continuous mixing process, rotational rate, blade pitch, high velocity interchamber flow, the injection pump pressure, and the ability to operate at various throughput rates all considered together would imply that the ordinary skilled artisan could use very short throughput times, including those of the instant claim 12, because time is money and the mixer only needs to mix the components as they will clearly react and foam after removal from the mixer in the above discussed process. See the abstract; column 1, lines 38-68; column 2, lines 11-17; column 3, lines 52-68; column 4, lines 30-68; column 5, lines 1-68, particularly 29-67; column 6, lines 1-68, particularly 1-6 and 58-68; column 7, lines 1-12 and the remainder of the document.

The applicant's arguments have been fully considered but are not persuasive for the reasons stated above and because the applicant has not shown that the eddies argued do not interrupt, i.e. baffle, the general flow of the chamber in any manner. It is noted that a mixing method is claimed. However, given that mixing polyol and polyisocyanate and blowing agent to

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give a foam is per se well known, it would appear that the mixing of the polyol and polyisocyanate and blowing agent to give a foam of the instant claims with the claimed device is the inventive concept. As such, for convenience and because the claims are plain to read, the device per se is specifically noted in the above rejection though it is clearly related to mixing polyol and polyisocyanate as can be seen in the statement that Day mixes polyols and polyisocyanates.

Day need not teach precision mixing. If they did, their disclosure would likely be anticipatory as "throttles" are a known and convenient means for achieving precision dispensing as taught by the cited secondary reference. Precision dispensing in Day would be desired as would be clear to the ordinary skilled artisan and the teachings of Roeser cited above. The above recitation to adjusting the speed of the blades is clear and provides the requisite obviousness rationale. To simplify, think of a motorboat with a propeller drive. Slow rotational speed gives low pressure and slow speed. Fast rotation gives high pressure and high speed. The same principle (attributed to fluid dynamics and Bernoulli's principles above) apply in the mixer of Day as does relativity. The mixer is fixed relative to the reaction chamber and thus cannot move. High speed will give high pressure where the reactants cannot move, i.e. the throttle is closed and low speeds will give low pressures where the throttle is closed. When the throttle is open, high speed will give higher throughput and low speed will give slower throughput. Reaction times can be varied as desired by the ordinary skilled artisan, i.e. the reactants will not fall out of the open exit for the reaction mixture in the above scenario. The reaction product can but will only move if there is a pressure gradient of some sort. The instant claims specify none specifically. Thus, that in Day is sufficient. The secondary references give clear reasons to vary

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speed and my mixer which is older than the applicant's filing date has variable speed, i.e. variable speed mixers are well known as stated above. No unexpected results are seen stemming from the differences between the instant claims and the cited prior art in a manner commensurate in scope with the instant claims and the cited prior art.

This rejection is maintained therefore.

4. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

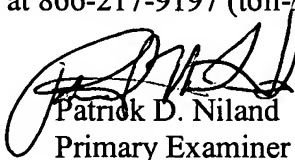
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick D. Niland whose telephone number is 571-272-1121. The examiner can normally be reached on Monday to Thursday from 10 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Patrick D. Niland
Primary Examiner
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